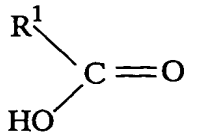
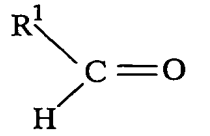
CLAIMS

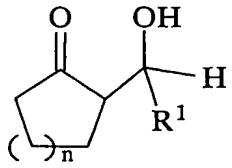
1. A process for producing a 2-(1-hydroxyalkyl)cycloalkanone and/or a 2-(1-hydroxyaryl)cycloalkanone represented by formula (3) (referred to hereinafter as compound (3)), which comprises the steps of subjecting a cycloalkanone, and an aldehyde represented by formula (2) (referred to hereinafter as aldehyde (2)) containing a carboxylic acid represented by formula (1) (referred to hereinafter as carboxylic acid (1)), to aldol condensation in the presence of water and a basic catalyst, wherein the molar amount (referred to hereinafter as A) of the basic catalyst added is not less than the molar amount (referred to hereinafter as B) of the carboxylic acid (1)represented by the formula (1)(referred to hereinafter as carboxylic acid (1)) contained in the aldehyde (2) and the difference between A and B, that is, (A - B) is 0.06 mol or less per mol of the aldehyde (2).



(1)



(2)



(3)

wherein n is an integer of 1 or 2, and R^1 represents a hydrogen atom or a C1 to C8 linear or branched alkyl group or a substituted or unsubstituted aryl group.

2. The process according to claim 1, wherein the ratio of added water to the cycloalkanone by weight is from 0.2 to 1.2.

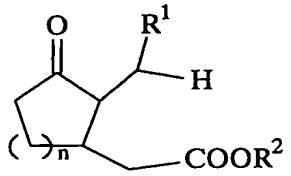
3. The process according to claim 1 or 2, wherein an aqueous layer obtained after the aldol condensation reaction is used again.

4. The process according to claim 3, wherein an aqueous layer recovered through pH adjustment with an acid and separation of the layer after the aldol condensation reaction is used again.

5. The process according to claim 4, wherein besides the basic catalyst in the amount described in claim 1, the basic catalyst is added in such an amount as to neutralize or alkalize

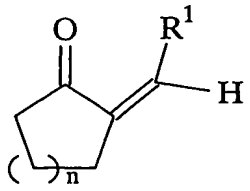
(to pH 7 or more) the aqueous layer before the aqueous layer is used again.

6. A process for producing alkyl(3-oxo-2-alkylcycloalkyl)acetate and/or alkyl(3-oxo-2-arylcycloalkyl)acetate represented by formula (7):



(7)

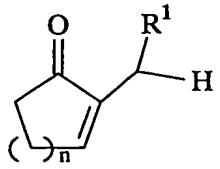
wherein n and R^1 have the same meaning as defined above and R^2 represents a C1 to C3 linear or branched alkyl group, which comprises the steps of dehydrating the compound (3) obtained by a method described in claim 1 or 2, to give 2-(alkylidene)cycloalkanone and/or 2-(arylene)cycloalkanone represented by formula (4) (referred to hereinafter as compound (4)):



(4)

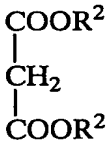
wherein n and R^1 have the same meaning as defined above, then isomerization reaction of the compound (4) to give 2-(alkyl)cycloalkenone and/or 2-(aryl)cycloalkenone

represented by formula (5) (referred to hereinafter as compound (5)):



(5)

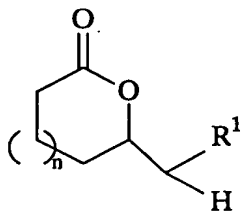
wherein n and R^1 have the same meaning as defined above, then reacting the compound (5) with a malonic diester represented by formula (6):



(6)

R^2 has the same meaning as defined above and two R^2 groups may be the same or different, and reacting the product with water to give the compound of formula (7).

7. A process for producing 5-alkyl-5-alkanolide and/or 5-aryl-5-alkanolide represented by formula (8):



(8)

wherein n and R^1 have the same meaning as defined above, which comprises the steps of dehydrating the compound (3) obtained by a process described in claim 1 or 2 to give the compound (4), subsequent isomerization reaction thereof to give the compound (5) and hydrogen reduction thereof, followed by Baeyer-Villiger oxidation.